

BIOLOGICAL NOTES ON *EUCRADA HUMERALIS* (MELSHEIMER) (Anobiidae)

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Little information is available concerning the two species in the genus *Eucrada*. Although incomplete, the following data concerning the life history of *humeralis* (Melsheimer) are offered now, since I see no opportunity to continue the observations in the near future. Every attempt has been made to include details of comparative value as an aid in the future systematic studies of the family Anobiidae. The mature larva of the species has been described by Böving (1954).

The larvae were discovered in a dead oak tree near Four-Mile Run, Arlington County, Virginia, on March 3, 1957. The tree, 5 inches in diameter and of solid wood, leaned against live trees. Its bark in most places was removed easily, revealing numerous various stage larvae of *humeralis* in their frass-filled burrows. These tunnels occurred on all sides of the trunk from approximately 6 feet above the ground to the base.

Although burrows that house mature larvae vary in length, they average about 4 inches, and the bore of each lies half way in the wood and half way into the bark. Because tunnels were not discovered deeper in the wood, it is concluded that the species will not be of economic importance. Tunnels excavated by newly hatched larvae are narrow but widen as the insect grows, so that the average diameter of a tunnel of a mature or nearly mature form measures 3-3.5 mm. Burrows may advance in any direction and, although their course may curve and turn, there is a tendency for them to parallel the long axis of the trunk. Occasionally burrows made by two individuals will meet, and frequently a tunnel will double back on itself, resulting in an excavation twice as wide as a single burrow.

The frass, which solidly packs the tunnels, is composed of rough or even jagged, fine but not powderlike bits of fecal material, some of which are dark and others light; it is not formed into the rounded pellets characteristic of certain other anobiids.

Before pupation the larva bores at an angle into the bark at the end of the tunnel, so as to come close to the surface. It then spins a cocoon, which completely fills the chamber, and pupates. Although some pupae and adults developed during the course of the observations in the spring, the coexistence of pupae, mature larvae, and early-stage larvae sug-

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gested that there may not be a definite period for adult emergence.

The cocoon is quite different from known pupal cases of most other anobiids but resembles remarkably those of certain bees. Cocoons have been deposited in the U. S. National Museum, where the cocoons and pupal cases of other anobiid species are also stored. The cocoon of *humeralis* is an elongate spheroid, with broadly rounded ends, approximately 5 mm. long and 2.5-3 mm. wide. Although constructed of many layers of moderately fine, threadlike strands, presumably an anal secretion, the finished casing appears parchment-like, the strands being matted together to form a tough, light brown, moderately rigid though thin fabric. In spite of the fact that bits of frass may adhere to the outside of the cocoon in various places, the frass is obviously not a part of the structure.

Though perhaps paler, the cocoons spun by *Hedobia granosa* Lec. (original observation), in the genus most closely related to *Eucrada*, resemble in every other way those of *E. humeralis*. *H. imperialis* (L.) (Xambeu, 1894), *regalis* (Duft.) (Portevin, 1896), and *pubescens* (Oliv.) (Wachtl, 1876) also construct silken cocoons, although the information available does not permit a further comparison of their appearance. The cocoons produced by *Ptilinerus marmoratus* (Reitt.) (original observation) differ from those of *E. humeralis* only by being much paler and perhaps not quite so rigid.

It seems that most anobiids do not spin a silken cocoon. Evidence on hand indicates that many and possibly all the others prepare a pupal enclosure by gluing together debris and fecal material with what may be a modified silk secretion.

After the adult of *Eucrada humeralis* emerges from the pupal exuviae, it gnaws an exit through the end of the cocoon closest to the surface of the bark and then through the thin partition of bark. Since the vacated case bears the cast larval and pupal exuviae at the end opposite the opening, it is concluded that the larva pupates with its head pointing toward its future exit path.

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